1. (Amended) A cyclone separator for separating a material from a fluid comprising a longitudinally extending body having a wall extending around an internal cavity, the wall having an inner surface, the internal cavity having, in transverse section, an inner portion in which the fluid rotates when the separator is in use to define a first cyclone and at least one outer portion positioned external to the inner portion and contiguous therewith, the outer portion of the cavity extending outwardly from the inner portion of the cavity each outer portion configured to produce at least one second cyclone exterior to the first cyclone and a low velocity zone in which material separated from the fluid travels longitudinally through the cyclone separator [and defining a zone in which at least a portion of the fluid expands outwardly as it rotates in the plane defined by the transverse section, the portion of the fluid in the outer portion of the cavity having different fluid flow characteristics compared to those of the fluid rotating in the inner portion of the cavity which promote the separation of the material from the fluid].

~~6~~. (Amended) The separator as claimed in claim 1 wherein the inner surface of the wall is configured to produce a boundary layer and material separated from the fluid by the second cyclone travels with the boundary layer longitudinally through the cyclone separator without substantial re-entrainment [to interact with the portion of the fluid to create a dead air space in the outer portion of the cavity].

7. (Amended) The separator as claimed in claim 6 wherein the boundary layer [dead air space extends] travels longitudinally in the same direction as the separator.

10. (Amended) The separator as claimed in claim 6 [8] wherein the outer portion has a receiving portion for receiving the material which is separated from the fluid and the separator has an upstream end and a downstream end and the receiving portion is positioned towards the downstream end of the separator and is in flow communication with a chamber downstream thereof.

11. (Amended) The separator as claimed in claim 5 wherein the inner surface of the wall around each of the outer portions is configured to interact with the portion of the fluid to create a low velocity zone [dead air space] in each of the outer portions of the cavity, and each of the low velocity zones [dead air spaces] extends longitudinally in the same direction as the separator.

14. (Amended) The separator as claimed in claim 1 wherein the wall in the region of each of the outer portions is configured to produce a local pressure differential within the outer portion [the rotation of the fluid in the inner portion defines a first cyclone and the inner surface of the wall is configured to interact with the portion of the fluid to cause the portion to rotate to define at least one second cyclone exterior to the first cyclone].

15. (Amended) The separator as claimed in claim 14 [5] wherein the local pressure differential is produced by shearing fluid over a discontinuity in the wall [the rotation of the fluid in the inner portion defines a first cyclone and the

inner surface of the wall around each of the outer portions is configured to interact with the portion of the fluid to cause the portion to rotate to define at least one second cyclone exterior to the first cyclone in each of the outer portions].

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16. (Amended) The separator as claimed in claim ~~14~~ wherein the wall is configured to produce a boundary layer flow and the local pressure differential is produced by configuring the wall to increase the boundary layer flow to a Reynolds number greater than 3000 [the rotation of the fluid in the inner portion defines a first cyclone and the inner surface of the wall around the outer portion is configured to interact with the portion of the fluid to create a dead air space in the outer portion of the cavity and to cause the portion to rotate to define at least one second cyclone exterior to the first cyclone].

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17. (Amended) The separator as claimed in claim 1 [wherein] constructed and arranged so that the fluid which is introduced into the cyclone comprises a gas which has a material selected from the group consisting of solid particles, a liquid, a second gas and a mixture thereof contained therein and a portion of the material is removed from the gas as the gas passes through the separator.

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18. (Amended) The separator as claimed in claim 1 [wherein] constructed and arranged so that the fluid which is introduced into the cyclone comprises a liquid which has a material selected from the group consisting of solid particles, a second liquid, a gas and a mixture thereof contained therein and a portion of the material is removed from the liquid as the liquid passes through the separator.

19. (Amended) The separator as claimed in claim 1 [wherein] constructed and arranged so that the fluid which is introduced into the cyclone comprises at least two fluids having different densities and the inner wall includes at least a portion which is configured to decrease the rate of acceleration of the fluid as it passes through that portion of the separator.

32. (Amended) A cyclone separator for separating a material from a fluid comprising a longitudinally extending body having a wall which, in transverse section, extends in a [continuous] closed path, the wall having a non-baffled inner surface which defines an internal cavity, the internal cavity having an inner portion in which the fluid rotates when the separator is in use to define a first cyclone, and at least one outer portion positioned external to the inner portion and contiguous therewith defining a zone in which the wall is configured to produce at least one second cyclone external to the first cyclone and to hinder re-entrainment of material separated from the fluid by the at least one second cyclone [impart to at least a portion of the fluid as it rotates in the plane defined by the transverse section different fluid flow characteristics compared to those of the fluid rotating in the inner portion of the cavity which promote the separation of the material from the fluid]

42. (Amended) The separator as claimed in claim 32 [36] wherein the inner surface of the wall around each [of the] outer portion[s] is configured to interact with the portion of the fluid to create a low velocity zone [dead air space] in each [of the] outer portion[s] of the cavity, and each low velocity zone [dead air space] extends longitudinally in the same direction as the separator.

45. (Amended) The separator as claimed in claim ~~32~~ 27 wherein the wall in the region of each of the outer portions is configured to produce a local pressure differential within the outer portion [the rotation of the fluid in the inner portion defines a first cyclone and the inner surface of the wall is configured to interact with the portion of the fluid to cause the portion to rotate to define at least one second cyclone exterior to the first cyclone].

46. (Amended) The separator as claimed in claim ~~45~~ 43 [32] wherein the local pressure differential is produced by shearing fluid over a discontinuity in the wall [the rotation of the fluid in the inner portion defines a first cyclone and the inner surface of the wall around the outer portion is configured to interact with the portion of the fluid to create a dead air space in the outer portion of the cavity and to cause the portion to rotate to define at least one second cyclone exterior to the first cyclone].

47. (Amended) The separator as claimed in claim ~~45~~ 43 [36] the wall is configured to produce a boundary layer flow and the local pressure differential is produced by configuring the wall to increase the boundary layer flow to a Reynolds number greater than 3000 [wherein the rotation of the fluid in the inner portion defines a first cyclone and the inner surface of the wall around each of the outer portions is configured to interact with the portion of the fluid to cause the portion to rotate to define at least one second cyclone exterior to the first cyclone in each of the outer portions].

60. (Amended) A cyclone separator for separating a material from a fluid comprising a longitudinally extending separator having a wall, the wall having

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an inner surface and defining an internal cavity within which the fluid rotates when the separator is in use to define a first cyclone, [the inner surface of the wall defined by, in transverse section, a continuous non-circular convex closed path, the cavity having an inner portion positioned within the non-circular convex closed path] and at least one outer portion and the at least one outer portion is configured to promote the separation of material from fluid in the at least one outer portion and to hinder re-entrainment in the outer portion of material separated from the fluid [between the inner portion and the non-circular convex closed path].

62. (Amended) The separator as claimed in claim 60 [61] wherein [one portion of the continuous non-circular convex closed path] the at least one outer portion defines a low velocity zone [dead air space] in which a portion of the material settles out from the fluid and the cyclone separator further comprises [has] a receiving portion for receiving the material which is separated from the fluid in the portion.

64. (Amended) The separator as claimed in claim 62 [60] wherein [the inner surface of the wall is configured to interact with the portion of the fluid to create a dead air space which] the low velocity zone extends longitudinally in the same direction as the separator.

65. (Amended) The separator as claimed in claim 60 [63] wherein [the rotation of the fluid in the inner portion defines a first cyclone and] the inner surface of the wall around each [of the] outer portion[s] is configured to interact

with the portion of the fluid to cause the portion to rotate to define at least one second cyclone exterior to the first cyclone in each [of the] outer portion[s].

66. (Amended) The separator as claimed in claim 60 wherein the wall in the region of each of the outer portions is configured to produce a local pressure differential within the outer portion [the rotation of the fluid in the inner portion defines a first cyclone and the inner surface of the wall around the outer portion is configured to interact with the portion of the fluid to create a dead air space in the outer portion of the cavity and to cause the portion to rotate to define at least one second cyclone exterior to the first cyclone].

67. (Amended) The separator as claimed in claim 66 [60] wherein the local pressure differential is produced by shearing fluid over a discontinuity in the wall [the outer portion of the inner surface of the wall is defined by, in transverse section, at least two of straight lines].

68. (Amended) The separator as claimed in claim 66 [60] wherein the wall is configured to produce a boundary layer flow and the local pressure differential is produced by configuring the wall to increase the boundary layer flow to a Reynolds number greater than 3000 [the inner surface of the wall is defined by, in transverse section, a plurality of straight lines which approximate a continuous non-circular convex closed path].

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office